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**(54) Menu-controlled formation of short messages**

(57) An electrical communication device contains a menu-controlled user interface 14, 15 by means of which a short message to be sent is created strictly according to a predetermined structure. The user interface 14, 15, presents questions to which the user gives an-

swers by selecting an option or by entering a string of characters on the keypad 14. The short message to be sent may contain the user's answers as such or the communication device may formulate the message on the basis of those answers such that it is more easily read by a human recipient and/or machine.

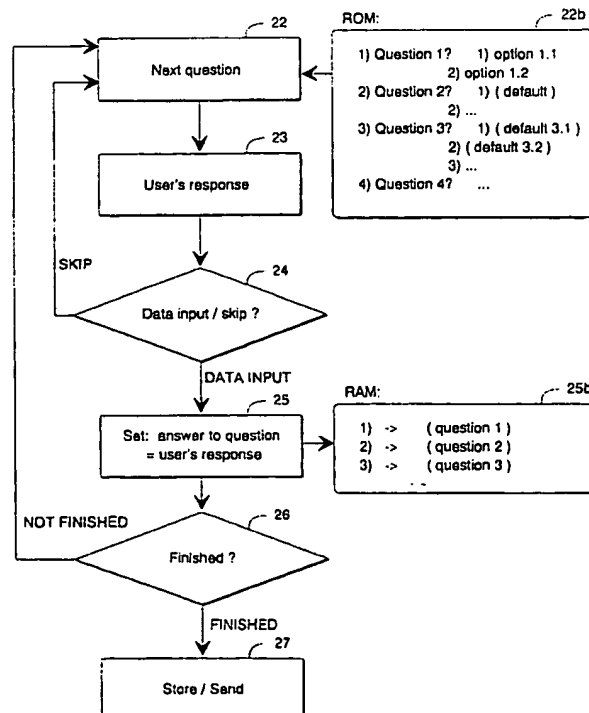


Fig. 2

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## Description

The invention relates in general to the drawing-up of messages in character string format in electronic apparatus, and in particular to the creation and sending of short messages by means of an electrical communication device.

The short message service (SMS) is a method of communication known from digital mobile phones, two-way paging devices and other corresponding communication devices, wherein a sender creates and sends by means of his apparatus a character string which is signalled through the communication system without the establishment of an actual telephone connection. Transmission of short messages requires only a little capacity of a transmission system, as compared to a circuit-switched or facsimile connection, so it is advantageous to use the SMS to convey short notices.

In the prior art, when a user creates a short message, he forms the character string one character at a time. A digital mobile phone usually has a keypad containing number buttons and special character buttons well as function keys. Because of the small size of mobile communication devices and the relatively large number of letters, the devices usually do not contain letter keys, but the user enters the letters using a special letter selection function, pressing number, special character and function keys in a certain order. Characters thus entered are shown on the device's display.

The formation of a textual message by means of the method according to the prior art is relatively slow since the selection of one letter may require several key-strokes.

An object of this invention is to provide a method whereby a short message can be quickly and easily formed so as to be sent.

This and other objects of the invention are achieved by a menu-controlled formation of a short message, wherein the user selects parts of the short message on the basis of questions and/or options presented by the communication device.

According to a first aspect of the present invention there is provided a method of creating a short message having a number of data fields on a mobile communications device for subsequent transmission via a short message service (SMS), the method comprising presenting a separate data input request to a user for each field, receiving a user response to each request, and compiling the received responses into a short message for said subsequent transmission.

Preferably, at least one of said fields consists of a plurality of alphanumeric characters.

Preferably, the step of compiling the received responses comprises inserting field separators between said fields. Alternatively, or in addition, said fields may have a predetermined length.

Preferably, said step of presenting separate input requests comprises presenting for each field at least

one possible response, said possible response being retrieved from a memory of the device, wherein said user response may comprise accepting said presented response.

Preferably, the number of fields making up said short message is predetermined and is stored in a memory of the device.

According to a second aspect of the present invention there is provided a method for creating a short message on an electrical communication device, which short message is a string of characters complying with a predetermined structure, characterised in that the communication device presents to the user data input options according to said structure and, in response to data entered by the user, said communication device compiles said short message in accordance with said structure.

In an embodiment of the invention, the syntax of short messages needed often or regularly is stored in the memory of the mobile phone or other communication device in the form of questions and/or options. The storage may be permanent in nature or it can be realized dynamically by loading the user interface part for a certain short message application in the communication device when needed. The loading according to need may be realized by delivering to the user a smart card or other memory medium which, when connected to the communication device, places the data in it at the disposal of the communication device. The device shows to the user on its display questions and/or menu options and the user responds to them either by entering characters by means of the device's keypad in a known manner, or by choosing one of the options given on the display. An option can be chosen in such a manner that the user either presses the number button representing the option in question or moves the cursor on the display to the desired option and presses a certain Enter key. When the message is completed the user presses a certain send or end key or responds confirmatively to the device's send and end questions so that the device saves the message in memory and/or sends it immediately via the communication network to the recipient in a known manner.

Embodiments of the the invention not only bring improvements on the characteristics according to the prior art, but provide a totally new and unforeseen function which until now has not even been required of short messages. Since the messages formed by means of the method comply strictly, if required, with a certain constant syntax, they are easily understood by a human recipient and are also suitable for further automatic processing by a receiving machine. This means the receiving apparatus can for example perform certain commercial actions (cf. telebank) or collect standard-form short messages from several senders and draw up statistics and reports based on them. Short messages according to the prior art have been free-form combinations of words and sentences and their recipients need

to possess human intelligence to understand them.

In a preferred embodiment of the method according to the invention, typing errors can be avoided if the sender creates the short message by successively choosing the desired multi-choice options, thereby avoiding the need to form words one character at a time.

Standard short messages have many possible applications, e.g. in the internal communications of a company, in trade between companies or private persons, and in communication between a consumer and a service provider.

The invention is described in more detail with reference to the preferred embodiments, presented by way of example, and to the accompanying drawings in which

Fig. 1 shows diagrammatically parts of a digital mobile phone, and

Fig. 2 shows a flow chart of a method of operating the phone of Fig. 1.

Fig. 1 shows a block diagram depicting part of a digital mobile phone. Operation of the phone is controlled by a central processing unit 11 (CPU), which advantageously is a microprocessor. It has at its disposal a random access memory (RAM) unit 12 in which all the runtime data is stored. The mobile phone also has a non-volatile read-only memory (ROM) block 13, which advantageously is an electrically erasable programmable read-only memory (EEPROM), which contains all the data that needs to be retained when power is switched off on the mobile phone. Part of the ROM block 13 may be located in a known manner in a smart card, such as a subscriber identity module or SIM card (not shown) connected to the mobile phone. In addition, the mobile phone has a keypad 14 and a display 15. Some mobile phones use touch-sensitive displays, in which case a separate keypad is not needed as the functions which are usually associated with the keypad are realized through the display. The mobile phone further comprises a communication part 16 which contains the electronic transmission and reception parts as well as radio-frequency parts in a known manner.

In the block diagram shown in Fig. 1 a certain part of the RAM 12 is designated as message, or SMS, memory 12a. The mobile phone uses this part of the memory for the temporary storage of short messages to be transmitted and it can be a permanently reserved or dynamically allocated memory area. In addition, part of the ROM 13 is reserved for the storage 13a of short message menus. It contains the standard question and possible optional answers that are needed for the creation and processing of standard short messages.

Fig. 2 shows a flow chart describing the method according to a preferred embodiment of the invention. There are several known methods to start the short message service on a mobile phone; selection of the appropriate option from the phone's function menu is one. The invention may also be applied in such a manner that the

user does not separately start the short message service but instead starts a certain service application (e.g. "bank services", "health services", etc.) that uses short messages for communication. For example, if the user selects a telebank service, he need not even be aware of the fact that the service is based on the use of short messages.

In step 22 the mobile phone reads from the ROM the questions associated with the application selected by the user as well as the answer structures associated with said questions. The list of questions and answer structures constitutes a menu for the creation of a short message according to block 22b. In this example it is assumed that the user pressed key 1, so that the short message creation menu includes questions about the desired function type, about the personal data of the owner of the account, and about the details of the function. The function type may be a balance enquiry or payment, so there are two options available for the first question.

In this context the word "question" must be understood very broadly, so that it covers all indications by means of which the mobile phone tells the user that it is waiting for a certain input and/or user action.

The display of a mobile phone is usually rather small, so it is advantageous to present the questions one at a time. The mobile phone displays the first question to the user, in this case "Balance or payment?". In block 23 the user presses a certain key corresponding to the option chosen by him. Let us assume that he chooses payment. In block 24 the mobile phone checks whether the user issued a skip command or entered data. A skip command means that the user will not answer this particular question. If the user entered data, the data is stored in the RAM according to blocks 25 and 25b. Next, the procedure returns via block 26 to block 22 and displays the next question, viz. "Payer's name?". At the same time, the following options are displayed:

- 1) John Smith
- 2) ...

wherein John Smith refers to the user's name, which the phone has read from the personal data stored in the SIM card. The user's name is the default because it is probable that the owner of a SIM card uses the mobile phone, to which the SIM card is connected, mainly to pay his own bills. The three dots in the second option mean that the user can enter any name by means of the mobile phone's keypad in a known manner. Again, the answer is stored in the RAM according to block 25 and 25b. The procedure once again returns to block 22 wherein the phone displays the third question "Account number?" and provides the following options:

- 1) 110101-123456
- 2) 110134-1234567
- 3) ...

wherein the two default values are the user's most commonly used account numbers and the third option means any account number entered on the keypad. The answer is stored in the RAM according to blocks 25 and 25b. Other questions may be e.g. the amount paid, for which there is no default, and the date of payment. When the user has answered all the questions the procedure regards the message as completed in block 26. According to a preferred embodiment, the mobile phone may display the completed message for verification by the user before sending, or it may prompt the user to press a certain OK key to send the message.

Thereafter, from the user's point of view the sending of the short message goes on as in the prior art, depicted by block 27. The transmitting device may send either a complete character string, comprehensible to a human, or only a code sequence which contains the user-entered data coded into a machine-readable form. Since the receiving device advantageously contains the same short message menus as the sender's device, it can reconstruct the message and carry out the operations required by it on the basis of the coded data, in which case the amount of data transmitted can be smaller.

As a second example, we can take a standard notice of meeting used inside a company. The sender of the notice selects the notice of meeting menu in the "Intracompany communications" function and enters the necessary data concerning the time and place and other particulars of the meeting in response to the questions displayed by the communication device. The resulting short message to be transmitted could be in plain language, e.g. as follows:

Meeting 12.30. In small conference room. Signed Anne.

The transmitting device may send either the whole character string shown above or just a code sequence containing the following information:

q1 : 12\*30  
q2: 2  
s: Anne

wherein the user, using the number keys, has entered "12\*30" in response to the first question and answered the second question by choosing option 2. The signature "Anne" may be entered by the user letter by letter, or the transmitting device may read it automatically from the SIM card or other memory medium. The formulation shown above, reconstructed by the receiving device, is intended to enhance the readability of the message for a human recipient. As the formulation is always the same, the receiver may also be a computer or a multi-purpose communication device containing the user's electronic calendar. Thanks to the standard formulation the receiving device can decode the message automatically and make an entry in the electronic calendar so that the user of the receiving device sees that he has a meeting at 12.30 in the small conference room and the

convener of the meeting is Anne.

It will be apparent to one skilled in the art that the embodiments described above are presented by way of example only and do not limit the invention. Different menus, options, and push-button or key commands are variations of the present invention. Also, the receiver can easily realize different variations of the formulation and processing of the standard messages, which variations are included in the scope of the invention defined by the claims set forth below. All functions required by the invention are advantageously realized as software processes, adding the required computer programs to the application software representing the mobile phone's user interface. Short message menus and other software related to the use of the method according to the invention can be loaded into the phone's memory in connection with software updates in accordance with the prior art.

## Claims

1. A method of creating a short message having a number of data fields on a mobile communications device for subsequent transmission via a short message service (SMS), the method comprising presenting a separate data input request to a user for each field, receiving a user response to each request, and compiling the received responses into a short message for said subsequent transmission.
2. A method according to claim 1, wherein at least one of said fields consists of a plurality of alphanumeric characters.
3. A method according to claim 1 or 2, wherein the step of compiling the received responses comprises inserting field separators between said fields.
4. A method according to claim 1 or 2, wherein said fields have a predetermined length.
5. A method according to any one of the preceding claims, wherein said step of presenting separate input requests comprises presenting for each field at least one possible response, said possible response being retrieved from a memory of the device, wherein said user response may comprise accepting said presented response.
6. A method according to any one of the preceding claims, wherein the number of fields making up said short message is predetermined and is stored in a memory of the device.
7. A method for creating a short message on an electrical communication device, which short message is a string of characters complying with a predeter-

mined structure, characterised in that the communication device presents to the user data input options according to said structure and, in response to data entered by the user, said communication device compiles said short message in accordance with said structure. 5

8. A method according to claim 7, wherein said structure is a sequence of successive answers comprising at least a first answer and a second answer the mutual order of which is predetermined, so that 10

- said communication device presents to the user a first question,
- in response to a first answer by the user the communication device presents to the user a second question, and 15
- in response to a second answer by the user said communication device creates a short message from the first answer and the second answer. 20

9. A method according to claim 7 or 8, wherein instructions for forming said structure are loaded into said communication device by storing them on a separate memory medium which can be connected to said communication device. 25

10. A method according to claim 8 or 9, wherein in order to create said short message said communication device adds to it, in addition to said first and second answers, words in plain language to enhance the understandability of the short message. 30

11. A method according to any one of claims 8 to 10, wherein in order to create said short message said communication device describes the elements of said short message with predetermined abbreviations the order of which complies with said structure. 35 40

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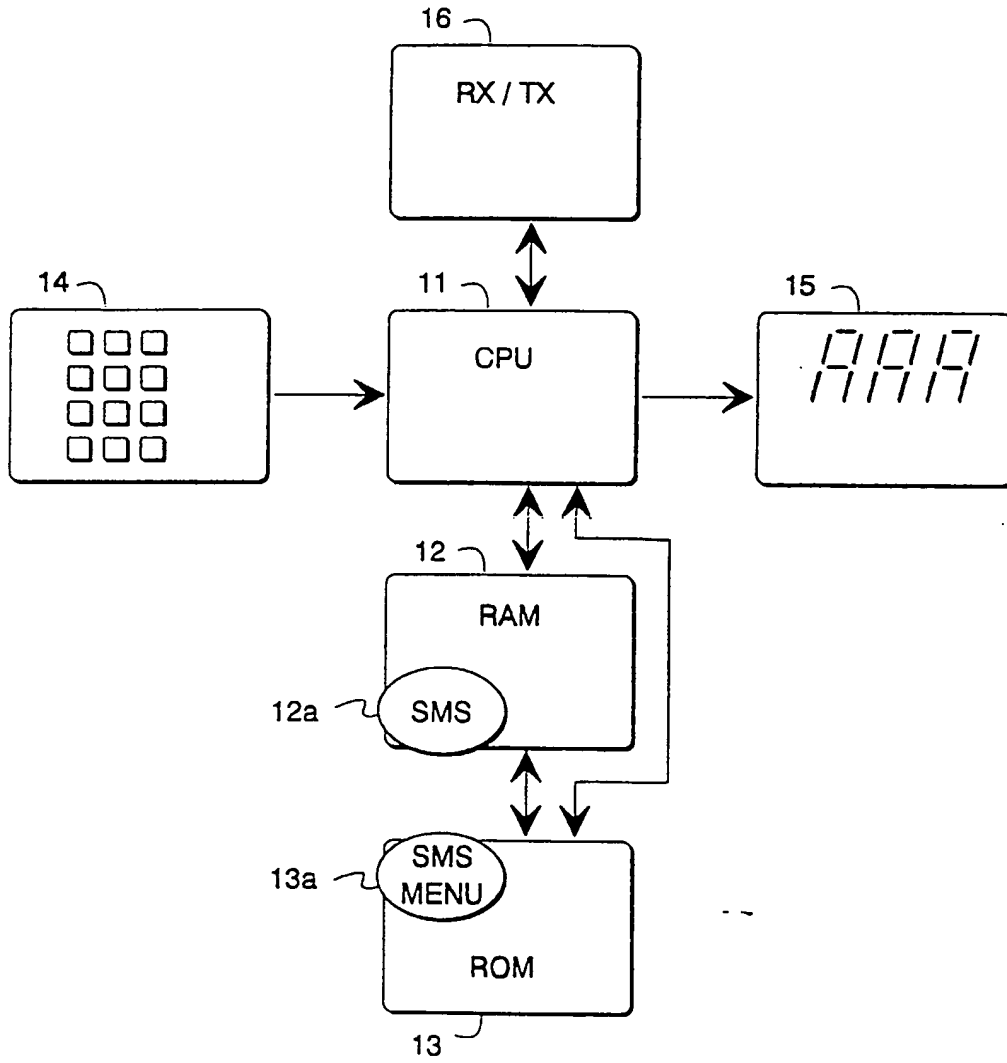


Fig. 1

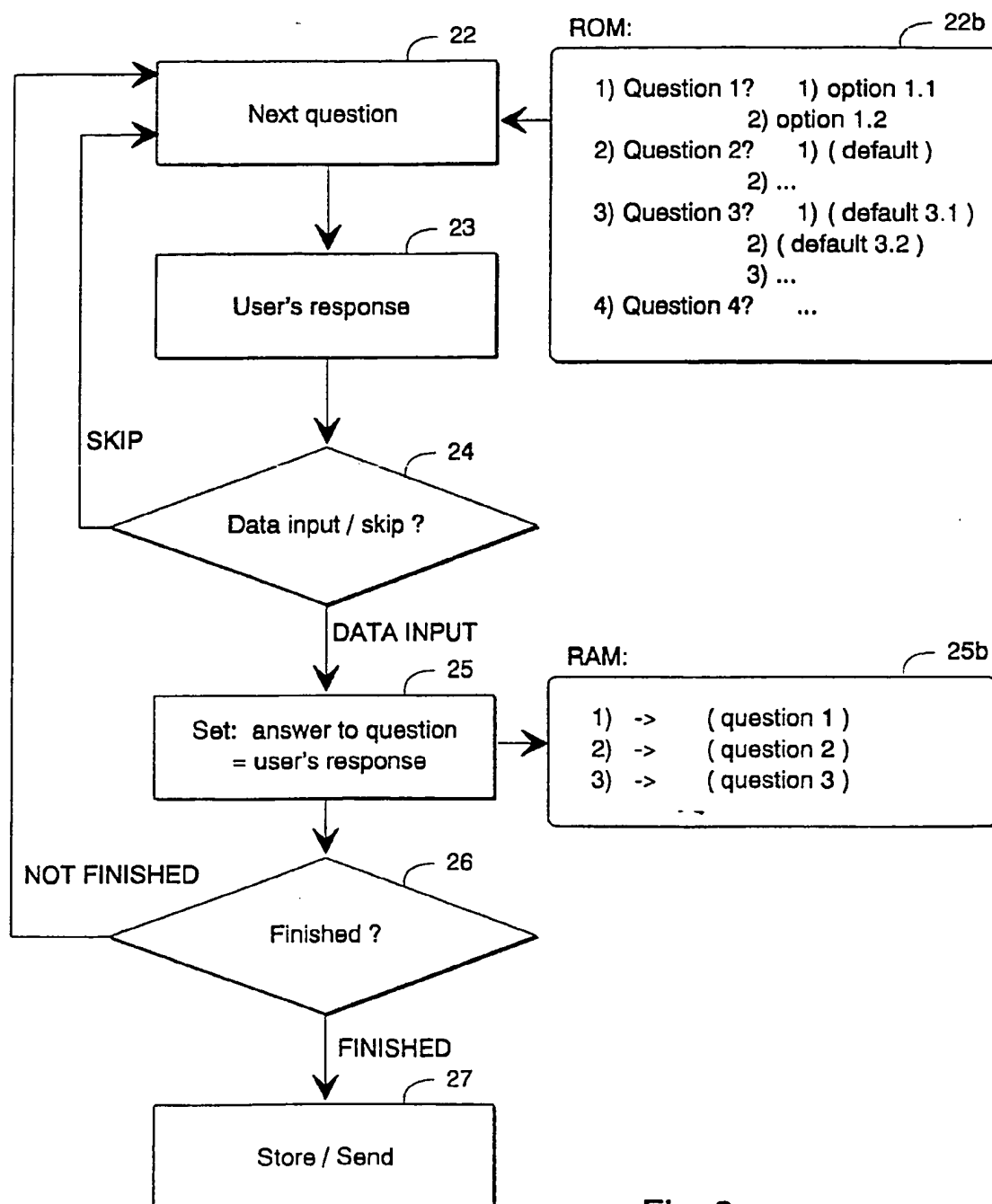


Fig. 2